

ETIOPATHOGENENSIS OF CHOLELITHIASIS WITH CHOLEDOCHOLITHIASIS



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CHOLELITHIASIS

vETIOLOGY

 $_{\upsilon}TYPES$

υ
PATHOGENESIS

UMORPHOLOGICAL FEATURES

 ${}_{\upsilon}\mathsf{COMPLICATIONS}$



υ **CHOLELITHIASIS**:

- 1. Very common throughout the world.
- 2. Affect 10 to 20% of adult population in developed countries.
- Majority of the gall stones are silent (>80%).
 TYPES :
- a. Cholesterol stones (>50% cholesterol monohydrate)
- b. Pigment stones (bilirubin ,calcium salts)





ETIOLOGY

CHOLESTEROL GALL STONES

- Demography: northern Europeans, North and South Americans .
- υ Advancing age
- υ Female sex hormones Female gender
- υ Oral contraceptives
- v Pregnancy
- υ Obesity and metabolic syndrome
- v Rapid weight reduction
- υ Gallbladder stasis
- υ Inborn disorders of bile acid metabolism
- υ Hyperlipidemia syndromes





ETIOLOGY : PIGMENT GALL STONES

- v Demography: Asians more than Westerners, rural more than urban
- υ Chronic hemolytic syndromes .
- v Biliary infection . (Escherichia coli, klebsiella)
- υ Gastrointestinal disorders: ileal disease (e.g., Crohn disease), ileal resection or bypass, cystic fibrosis with pancreatic insufficiency



υ**CHOLEDOCHOLITHIASIS** :

- Presence of a gallstone in the common bile duct.
- 15 % who have gall stones develop stones in CBD .
 TYPES :
- 1. Primary stones : Form primarily in the bile ducts (brown pigment stones). Result from stasis and subsequent infection.
- 2. Secondary stones : Form in the gall bladder but migrate to the bile ducts. (most common)
- 3. Recurrent stones : Develop in the ducts >3yr after surgery





Types of stones

- $\upsilon~$ Pure cholesterol stones
- υ Pigment stones
- $\upsilon~$ Pure pigment stones
- υ Mixed stones (80%) most common
- $\boldsymbol{\upsilon}$ Combined stones



TYPE OF STONE	INCIDENCE	COMPOSITION	COLOUR/SHAP E	NATURE	NUMBER/SIZE
PIGMENT STONES	5%	CALCIUM BILIRUBINATE	DARK BROWN ,	FRIABLE , CRUMBLES AT PRESSURE	VARIABLE
PURE PIGMENT STONES	5%	BILE PIGMENT,CA.BILI RUBINATE	BLACK,SHINY, IRREGULAR	DIFFICULT TO CRUSH	MANY (3 -5 CMS) IN DIAMETER
PURE CHOLESTEROL STONES	RARE	PALE,OVAL. C/S : RADIALLY ARRANGED WITH PIGMENTED NUCLEUS	PALE	SMOOTH SURFACE,CUTS WITH DIFFICULTY	SINGLE (2 -5 CM) IN DIAMETER
MIXED STONES	80%	CHOLESTEROL, BILE PIGMENTS	GREENISH BLACK,	SMOOTH SURFACE	VARIABLE
COMBINED STONES	10 %	STONE OF ONE TYPE SURROUNDED BY A SHELL OF ANOTHER TYPE	CHOLESTEROL STONE MAY BE SURROUNDED BY A MIXED STONE	VARIABLE	SINGLE (BARREL STONE)



(HARD)

Figure 21.40 🔶 Pure gallstones of various types.



Figure 21.42 🔶 Mixed and combined gallstones.

PATHOGENESIS OF CHOLESTEROL STONES

- Cholesterol is rendered soluble in bile by aggregation with bile salts and lecithins.
- When cholesterol concentration exceeds the solubilising capacity of bile cholesterol can no longer remain dispersed nucleates into solid cholesterol monohydrate crystals .
- A. Supersaturation of bile with cholesterol
- B. Hypomotility of the gall bladder.
- c. Accelerated cholesterol crystal nucleation
- D. Hypersecretion of mucus in the gall bladder











PATHOGENESIS OF BROWN PIGMENT GALL STONES



PATHOGENESIS OF BLACK PIGMENT GALL STONE



COMPLICATIONS

- υ Acute and chronic cholecystitis
- υ Jaundice
- υ Acute cholangitis
- υ Acute pancreatitis
- υ Gallstone ileus
- υ Empyema and mucocele
- υ Biliary fistula
- υ Perforation
- υ Gall bladder cancer



ACUTE CHOLECYSTITIS

- Episode of acute biliary pain accompanied by fever and right hypochondrial tenderness and guarding with persistence of symptoms beyond 24hrs.
- v Associated with gall stones (90%).
- υ Classified into CALCULOUS, ACALCULOUS, EMPHYSEMATOUS.















ACUTE CHOLECYSTITIS - GROSS



Acute cholecystitis - microscopy









Acute emphysematous cholecystitis

Uncommon variant of acute cholecystitis charecterised by production of gas by the infecting bacterial organism.

vBile cultures are positive for clostridial organisms most common clostridium welchii.

vContributing factor : Vascular occlusion of cystic artery by atherosclerosis or small vessel disease.



Chronic cholecystitis - Gross





MICROSCOPY



MICROSCOPY - CHRONIC CHOLECYSTITIS



VARIANTS

LYMPHOPLASMACYTIC CHOLECYSTITIS



- Form of chronic acalculous cholecystitis characterized by a diffuse, plasma cell-rich inflammatory infiltrate mostly confined to lamina propria (not extending to deeper layers).
- Associated with autoimmune disorders such as ulcerative colitis, primary sclerosing cholangitis, and autoimmune pancreatitis, IgG4-related autoimmune disorders that afflict the pancreatobiliary tract, and accordingly was termed sclerosing cholecystitis.
- Occur secondary to obstructive processes in extrahepatic bile ducts.



- Numerous prominent lymphoid follicles are present in the lamina propria throughout the gallbladder are referred to as follicular cholecystitis.
- Such cases constitute less than 0.1% of cholecystectomies.
- Typhoid fever, Gram-negative infections (98) and sclerosing cholangitis.
- Follicular cholecystitis may or may not be associated with gallstones.

FOLLICULAR CHOLECYSTITIS

EOSINOPHILIC CHOLECYSTITIS



- Marked infiltrate composed predominantly or almost exclusively of eosinophils.
- It often involves the muscular layer but may be transmural or restricted to the mucosa.
- The cystic duct may also contain eosinophils.
- Peripheral eosinophilia syndromes, including allergic conditions such as asthma, and atopic diseases as well as the socalled hypereosinophilic syndrome



- Characterized by a prominent proliferation of foamy macrophageS often associated with cholelithiasis.
- Occur due to ulceration of the gallbladder mucosa and/or rupture of Rokitansky-Aschoff sinuses with extravasation of bile
- Lymphocytes, plasma cells, and Touton-like or foreign-body-type giant cells (often with cholesterol crystals) are usually admixed with the foamy macrophages.

XANTHOGRANULOMAT OUS CHOLECYSTITIS

CHOLESTEROSIS

Increased hepatic synthesis of cholesterol and triglycerides

- Gross : lipid deposits appear as yellow flecks against a dark green background.
- When extensive form cholesterol polyps.



MICROSCOPY

 Accumulation of foamy macrophages in the expanded lamina propria .

> Foamy macrophages



PORCELAIN GALLBLADDER

- Calcification of gall bladder
- Complication of chronic cholecystitis
- Gross : wall and surfaces of the gall bladder are hard, pearly white.



CHOLANGITIS

- Inflammatory diseases of bile ducts are collectively called cholangitis.
- TYPES : simple obstructive, recurrent cholangitis syndrome, primary sclerosing cholangitis.





ACUTE PANCREATITIS



HYDROPS OR MUCOCELE : Distension of gall bladder by a clear watery or mucoid material .

May contain over 1500 ml of fluid.

EMPYEMA : Acute cholecystitis in presence of bacteria containing bile progress to suppurative infection.

Gall bladder is filled with purulent material.





Empyema and Mucocele of the gallbladder

Empyema and Mucocele



BILIARY FISTULA

- Biliary fistula is a type of fistula in which bile leaks from the bile ducts into surrounding areas.
- Gall stone associated necrosis and inflammation of gall bladder and bile ducts.





References

vandersons pathology vol 2 ;tenth edition; pg no 1601 -1607

vBOYDS TEXTBOOK OF PATHOLOGY TENTH EDITION; VOL 2 ;PG NO 1053 -1062

vROBBINS AND COTRAN PATHOLOGIC BASIS OF DISEASE ;9TH EDITION; VOL 2 ;PG NO 860 - 873.

 $\upsilon STERNSBERG'S DIAGNOSTIC SURGICAL PATHOLOGY VOL 1 ; 5TH EDITION PG NO 1165 - 1178$



